

## Summary Report of White Sturgeon Facility Efficiency Experiments

### Investigators

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### Summary

The U.S. Bureau of Reclamation's Tracy Fish Collection Facility (TFCF), located in the southern Sacramento-San Joaquin Delta (Delta), was designed to divert juvenile Chinook salmon (*Oncorhynchus tshawytscha*) and striped bass (*Morone saxatilis*) from Delta Mendota Canal (DMC) flows, thereby preventing entrainment loss to the downstream Jones Pumping Plant (JPP, Central Valley Project; Bates *et al.* 1960). Fish entrainment is defined as "the incidental trapping of any life stage of fish within waterways or structures that carry water being diverted for anthropogenic use" (NMFS 2010). The TFCF uses a louver-bypass system to intercept and guide fish from DMC entrainment into collection tanks, where they are held until they are truck-transported back to the Delta and away from the immediate influence of the JPP. Fish and exported flows enter the facility underneath a surface debris collector (trash boom), through a trashrack with 5.1-cm-wide (2.0-in-wide) bar spacing and the 25.6-m-wide (84-ft-wide) primary channel to one of four bypass entrances along the louver wall. Once inside a bypass entrance, fish move into underground concrete pipes to the secondary channel where they encounter a double-louver wall. Fish guided successfully by these louvers are diverted to one of four fish collection tanks. Although the louver/bypass components were designed to screen and salvage fish from exported flows, there are many potential areas where fish loss can occur, and the facility is reportedly not 100% effective (Karp *et al.* 1995; TFCF unpublished data).

Green sturgeon (*Acipenser medirostris*) abundance is declining in the Delta due in part to non-native fish introductions, and habitat alterations from long-term operations at JPP and California's Harvey O. Banks Pumping Plant (Moyle 2002; NMFS 2006, 2009). Recently, NMFS completed a biological opinion stating TFCF operations are likely to jeopardize the continued existence of the threatened southern Distinct Population Segment of the North American green sturgeon (NMFS 2009). Historic TFCF data indicate juvenile green and white (*A. transmontanus*) sturgeon may be salvaged

throughout the year at the TFCF, but are uncommon. The objective of this plan is to summarize past studies evaluating facility efficiency of white sturgeon, which was used as a surrogate for, and is similar to, the green sturgeon (NMFS 2010).

### **Problem Statement**

Green sturgeon is declining in the Central Valley of California and is listed as a threatened species under the Endangered Species Act (NMFS 2006). Recently, NMFS determined operations of JPP may adversely affect the existence of green sturgeon in the Delta (NMFS 2009). Both juvenile white and green sturgeon are uncommon at the TFCF, but may be entrained in the fish salvage throughout the year.

### **Goals and Hypotheses**

1. Determine facility efficiency for juvenile white sturgeon.

### **Materials and Methods**

Release recapture experiments were used to measure facility efficiencies. Juvenile white sturgeons were released into the primary channel, and their recovery in the holding tank was determined under a range of hydraulic conditions.

### **Coordination and Collaboration**

These studies will be coordinated with the California Department of Fish and Game's Delta diversion facilities reporting program, and the TFCF staff. All work will be reviewed by the Tracy Technical Advisory Team through progress updates on request and reviews of study plans and all reports.

### **Endangered Species Concerns**

Incidental "take" of ESA listed salmon, steelhead (*Oncorhynchus mykiss*), and delta smelt (*Hypomesus transpacificus*) is possible, and such fish will be returned to Delta waters as quickly as possible. The total number of each ESA species incidentally caught or collected during the experiment will be recorded and sent to the reporting agencies. The incidental take from this research is covered under the TFCF Section 10 permit.

### **Dissemination of Results (Deliverables and Outcomes)**

Provide draft and final summary report of experimental findings by September 30, 2012.

### **Literature Cited**

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